



Research Note

Living with Wildfire in Log Hill Mesa, Colorado

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Introduction

Over the past 50 years, Colorado has experienced an increase in the number and size of wildfires on its public and private lands. Nationwide, expenditures on wildfire suppression have increased for decades and now are measured in the billions of tax dollars. Current trends in climate changes, fuel accumulation from past wildfire suppression, and expansion of the wildland-urban interface (WUI), which means more development within areas of heightened wildfire potential, all suggest that continued increases in the costs of wildfires are likely.

Wildfire risk mitigation refers to activities performed proactively, before a hazard event occurs, that reduce the chances and/or consequences of a wildfire. The actions taken by individual residents toward mitigating their properties' wildfire risks can play an important role in the effort to reduce the catastrophic effects of wildfires both to society as a whole and to the residents themselves. However, the relationships among wildfire-risk mitigation activities and attitudes, experiences, and other considerations are complex (Brenkert-Smith and others 2006, 2012), and WUI residents may be defined by subpopulations that differ widely in perspectives about wildfire issues (Raish and others 2007).

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Although recent research finds substantial levels of awareness and concern about wildfire among WUI residents in Colorado's Larimer and Boulder Counties (Champ and others 2011a,b), it is not clear that findings about the wildfire-related knowledge, attitudes, and behaviors of residents of Colorado's Front Range are similar to residents in other areas, such as Colorado's more sparsely populated yet rapidly growing Western Slope. This research note summarizes two related datasets for the Western Slope community of Log Hill Mesa, in Ouray County. These data include an assessment of the physical characteristics of residential properties in the community and a general population survey of the residents of those same properties (see Appendix A for a copy of the survey, with descriptive statistics for all survey questions).

In addition to providing baseline information about residents of the Log Hill Mesa community and their perspectives and behaviors related to wildfire risk, these coupled datasets allow investigation of a possible gap between residents' assessments of the wildfire risk on their property compared to that of a wildfire specialist. Although the general existence of such a risk perception gap is well documented in the risk (Slovic and others 1974; Slovic 1987) and wildfire literatures (Cohn and others 2008; Champ and others 2009), little is known about the nature of this gap. For example, are residents aware of their status with respect to individual risk factors, but unaware how experts aggregate these factors into measures of overall risk?

This report is intended to provide information regarding knowledge, concern, and activities related to wildfire and wildfire risk mitigation among residents of the Log Hill Mesa community. It also summarizes the study design, respondent characteristics, and results of a Log Hill Mesa community household-level survey. In addition, it summarizes the results of the corresponding assessment performed by a wildfire specialist for those same properties. It analyzes these results to offer a better understanding of both the potential differences between responders' and non-responders' properties and of the existence and nature of a risk perception gap for understanding wildfire risk.

This analysis finds evidence of a general underestimation of property-specific, overall wildfire risk by residents versus the assessments of the same property by a wildfire specialist. On average, residents reported lower risk categories than the specialist did for five of the ten property attributes assessed: the distance to dangerous vegetation and to other combustibles, the flammability of the structure's external material and that of any decks on the structure, and address visibility. In contrast, residents on average reported relatively higher risk categories for driveway width and background fuel density, and the two assessments typically agreed on risk category for the number of roads available for evacuation, the distance to topography dangerous for wildfires, and the type of roof installed.

The findings of this report can facilitate long-term monitoring, management, and educational practices related to the mitigation of wildfire risk in WUI communities like Log Hill Mesa. In particular, the risk perception gap results suggest specific targets for improving residents' understanding of the sources of wildfire risk on their properties and for subsequently encouraging the mitigation of that risk. In addition, this report improves understanding about the perception of risks in general.

Methods

The BLM Southwest District Fire Management program and the West Region Wildfire Council (WRWC) seek to encourage residents of western Colorado to mitigate the risk of wildfire on their properties. As part of this effort, and combined with the development of Community Wildfire Protection Plans (CWPP), WRWC is conducting wildfire risk assessments of private properties and administering household surveys in the communities where the wildfire risk assessment has been completed. This research note focuses on the related research instruments for the community of Log Hill Mesa.

Study Area: Log Hill Mesa Fire Protection District (LHMFPD)

The Log Hill Mesa Fire Protection District (LHMFPD) covers approximately 65 square miles of wildland-urban interface (WUI) in Ouray County, Colorado. Between 1989 and 2010, this district experienced more than 60 wildfires of varying size. The district contains an estimated 70% of Ouray County's value at risk, in terms of structures and their contents, reflecting the area's high density of high-valued homes (WRWC 2012). The district also contains numerous assets to the broader area, such as historic structures, utility transmission lines, a natural gas pipeline, a golf club, and abundant wildlife.

Motivated by the combination of high wildfire risk and the concentration of substantial social and economic values within the district, the WRWC recently published a CWPP for the LHMFPD (WRWC 2012) as a focused addendum to Ouray County's CWPP. The LHMFPD CWPP is intended to "provide its residents with an education tool that was specific to each and every homeowner in the district" (p. 1) and will be updated annually to reflect changes in wildfire risks over time, including those instigated by this assessment and the CWPP development process.

Wildfire Specialist Assessment

As part of the CWPP effort, WRWC conducted a wildfire risk assessment of every privately owned, residential parcel in the LHMFPD with a home larger than 800 square feet. This risk assessment, described in more detail below, is based on the Home Ignition Zone concept (Cohen 2000) and has been developed over a series of implementations by researchers and practitioners¹. In the assessment, parcels are rated by a wildfire specialist on ten attributes related to wildfire risk and given an overall wildfire risk rating that addresses not only structure survivability during a wildfire event but also considerations such as firefighter access and evacuation potential. By design, these ratings reflect a property's risk relative to the overall level of risk within the LHMFPD rather than reflect an absolute risk rating.

¹ The Home Ignition Zone concept was developed by Jack Cohen at the Fire Science Lab in Missoula, Montana, and by research from the Institute for Business and Home Safety. The assessment as implemented here is an amalgam of that concept, Christopher Barth's work with the Colorado Springs Fire Department and other entities, Claire Hays' work on the Wildfire Hazard Information Extraction (WHINFOE) model, and Boulder County's Wildfire Hazard Identification and Mitigation System (WHIMS).

WRWC sought permission to enter properties for this risk assessment through numerous requests, including in person at homeowners' association (HOA) meetings, mailed postcards, email notices, inclusion in HOA newsletters, and posted flyers. For interested residents, the wildfire specialist provided in-person, step-by-step analysis of their property's wildfire risk with the opportunity to ask questions or describe the specifics of their property (14 properties). Remaining properties were either assessed without the resident present (60 properties), or, when permission to enter was not received², assessed from public roadways, information on the Ouray County Assessor's website, or with aerial photography (528 properties). In most cases, this combination of alternative sources overcame the limitations of not being able to enter properties, especially for variables such as defensible space and background fuels. However, the variables for decking materials and the distance to other combustibles are not as easily seen by alternative methods, so when these characteristics could not be directly observed, the specialist had to make assumptions. As a default, when a characteristic was unobservable without access, the professional assessment defaulted to higher risk categories, such as assuming the presence of a wooden deck and other combustibles within 10 feet of the structure. These assumptions could bias the specialist assessments toward higher levels of risk in relevant categories.

The WRWC completed these assessments for all 602 primary residential structures in the LHMFPD, including structures not identified in county assessor records but only discovered through on-the-ground analysis of the district³. All assessments occurred between August 18, 2011, and October 6, 2011, and they pertain to the state of the property at the time of assessment. The rating that would be assigned to a property might change over time, reflecting that assessed property characteristics might vary over time with homeowner behavior such as maintenance (e.g., grass mowing and needle clearing) or the movement of combustible materials such as porch furniture or propane grills.

Resident Survey

In a companion effort, the WRWC conducted a household survey of residents of all 608 properties in the LHMFPD, as identified by county assessor records. The survey contained seven sections designed to collect information about respondents' housing situation, their experience with wildfire, knowledge of wildfire risk, attitudes about wildfire, social interactions, information sources, incentives and barriers toward undertaking mitigation actions, and demographic characteristics. The survey also asked residents to assess their property based on the same ten attributes related to wildfire risk that were assessed by the wildfire specialist, as described above. A copy of the survey instrument can be found in its entirety in Appendix A.

Respondents were mailed a copy of the survey on Thursday, June 13, 2012, and asked to participate by filling out the survey and returning it in the included postage-paid

² Residents were informed that the assessment would be completed without entering the property when permission was not granted, so a lack of permission is not necessarily an indication of a lack of interest in having a property's wildfire risk assessed.

³ Note that county assessor records did not perfectly match the results of on-the-ground assessment, leading to different numbers for household surveys mailed and specialist assessments completed. Data collection efforts allowed professional assessments to match actual conditions, and only matched pairs of resident surveys and professional assessments were analyzed for a possible risk perception gap.

envelope. This date means surveys were administered after publication of the draft CWPP, which includes detailed, property-level results of the assessment. Therefore, any risk perception gap observed in these data persists despite numerous opportunities provided by the WRWC for residents to learn about their properties' specific wildfire risk factors. To encourage survey participation, a reminder postcard was mailed to non-respondents on July 5, 2012, and a third and final mailing, including an additional copy of the survey, was sent to non-respondents on Thursday, August 2, 2012.

Household Survey Results

Of the 608 initial surveys that were mailed, 140 were not able to be delivered. Respondents in 291 households completed the survey for a response rate of 62% (291/[608-140]). The results summarized in the rest of this report are based on analysis of both the resident surveys and the wildfire specialist assessments; this section focuses on survey results.

Characteristics of the Survey Respondents and Their Residences

Respondents ranged in age from 27 to 96 years old, with an average age of 62 years old. Nearly half (49%) were retired, and about a quarter (29%) were employed full-time. More males (63%) responded than females, although numerous respondents (4%) selected both genders on the survey, suggesting that many couples filled the survey out together. Survey respondents were more educated than the general Ouray County population as a whole (70% of respondents were at least college graduates compared to 49% for Ouray County and 44% for Colorado [U.S. Census Bureau 2011]). Twenty-four percent of respondents indicated having completed an advanced degree. The median reported income was between \$75,000 and \$99,999, higher than that for Ouray County households (\$61,935) or for households statewide (\$57,685) from 2007 to 2011 (U.S. Census Bureau 2011). Note that the targeted population (i.e., residents of LHMFPD) is a subset of Ouray County overall (602 households versus 1,688 households county wide [U.S. Census Bureau 2011]) and is not intended to be representative of the county as a whole.

The vast majority of respondents owned their residence in LHMFPD (93%) and most indicated living there year-round (82%). Typical respondents have lived in their current residence for about 10 years (median move in year is 2003) and expect to stay there for at least five more years (20% expect to move within 5 years). Move-in dates suggest that many did not build their own homes, because the median year in which respondents' homes were built was 1999.

Attitudes toward Wildfire

Attitudes about wildfire were measured with respondents' level of agreement with numerous statements (1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree). Respondents generally showed strong support for wildfire suppression, either when human life is threatened (38% agree and 55% strongly agree) or

when property is threatened (48% agree and 38% strongly agree). Respondents were mixed regarding the statement that “naturally occurring wildfire is not the problem; people who choose to live in fire prone areas are the problem” (35% agree or strongly agree, 31% disagree or strongly disagree, 35% neutral) but more disagreed that “with proper technology, we can control most wildfires after they have started” (24% agree or strongly agree, 45% disagree or strongly disagree, 31% neutral). Most respondents considered wildfires a natural part of the balance of a healthy forest or ecosystem (40% agree, 42% strongly agree).

Experience with Wildfire

Survey respondents reported limited personal experience with wildfire⁴. None reported any damage to their current residences from wildfire or smoke, and few have had a wildfire on their property (2%). Similarly, none have received a reverse 911 call to evacuate or prepare for evacuation due to wildfire (although one respondent indicated having evacuated due to a wildfire or threat of wildfire). However, although more than one-quarter were not sure how close wildfire has ever come to their property (28%), almost half were aware of wildfires in their vicinity (29% within 2 miles, and 18% within 2 to 10 miles). In addition, many reported second hand wildfire experience in terms of knowing someone who has been evacuated due to wildfire (30%) or knowing someone whose home was damaged due to wildfire (16%).

Awareness, Concern, and Perception of Wildfire Risk

Despite limited firsthand experience with wildfire, respondents reported a high level of awareness and concern about wildfire risk at their residences. Most were aware of wildfire risk when buying or first renting their residence (91%) and agreed with the statement “your property is at risk of wildfire” (54% agree, 22% strongly agree). Similarly, 93% indicated they were concerned about wildfire risk affecting their residence. The majority of respondents noted having an evacuation plan in case of wildfire (76%), possibly reflecting widespread knowledge that the LHM Volunteer Fire Department has published a well-documented evacuation plan.

A small proportion of respondents (12%) believe that there is a greater than 50% chance of a wildfire occurring on their property in the year of the survey, whereas half of respondents think that that chance is 30% or less. One in three respondents (35%) believes that, if a fire does occur on his or her property, there is a 50% or greater chance that their home would be damaged or destroyed.

For more detail into respondents’ expectations about wildfire, the survey asked respondents to rate the likelihood of certain impacts if a wildfire did occur on their property. Impacts were rated on a scale from 1 (“Not likely”) to 5 (“Very likely”). Based on evaluating responses from 1 to 2 as corresponding with unlikely outcomes and from 4 to 5 as corresponding with likely outcomes, most respondents expected their landscape to burn (77%) and their home to receive some type of damage (66% for smoke damage, 60% for physical damage) if a wildfire occurred on their property. However, respondents were split regarding expectations that their home would be

⁴ Although approximately 60 fires have occurred in the LHMFPD in the past 20 years, the majority of these have been small fires, such as fires affecting only a single tree.

destroyed in that case (37% each for likely and not likely). Although 62% thought it was unlikely they personally would put the fire out, half expected that the fire department would save their home (49%).

Wildfire Risk Information Sources

Respondents reported receiving information about reducing the risk of wildfire from a variety of sources. Most commonly, they reported learning from the local fire department (68%). Other common information sources include WRWC (40%), neighborhood groups such as the HOA or neighborhood watches (44%), and the media (35%). Less commonly reported information sources include government agencies such as the Colorado State Forest Service (27%) or the US Forest Service or Bureau of Land Management (20%). Few have been contacted by their insurance company about wildfire risk (9%), and about half of those report receiving information about reducing their property's wildfire risk from that company (59%), similar to the 54% who report paying a higher homeowner's insurance premium due to wildfire risk. Nearly one in ten claimed to have not received any information about wildfire (9%). About one-third reported learning about reducing wildfire risk from neighbors, friends, or family members (32%), and more than half reported having discussed wildfire issues with a neighbor (56%).

Mitigation of Property-Level Wildfire Risk

In general, respondents demonstrated a high level of willingness to undertake wildfire mitigation on their properties. Very few agreed that they "live here for the trees and will not remove any of them to reduce wildfire risk" (45% disagree and 33% strongly disagree). Similarly, most did not agree that "managing the wildfire danger is a government responsibility, not [theirs]" (45% disagree, 33% strongly disagree) or that "actions taken by homeowners to reduce the risk of loss due to wildfire are not effective" (49% disagree, 34% strongly disagree).

When asked about the density of the vegetation on their property (on a scale from 1 = "very sparse" to 5 = "very dense"), respondents reported a reduction in average perceived density rating from 3.7 at the time they moved in to a current average rating of 2.9. Asked the same about their neighboring properties, respondents reported a much smaller average decrease in vegetation density, from an average of 3.8 to an average of 3.6. Relatedly, more than half (58%) reported knowing that at least one of their neighbors has taken actions to reduce the risk of wildfire on their property, and of those, 37% have worked with their neighbors for that purpose on either their or their neighbors' properties. In contrast, 53% reported knowing that at least one neighbor was not taking action to reduce wildfire risk. However, few agreed that they "don't take action [on wildfire risk] because adjacent properties are not treated leaving [their] actions ineffective" (44% disagree, 33% strongly disagree).

When respondents were asked about factors that keep them from undertaking actions to reduce the wildfire risk on their property, top responses included financial expenses (39%), physical difficulty of doing the work (38%), and time it takes to do the work (30%). A smaller proportion of respondents reported barriers of not wanting to change the look of their properties (28%), a (perceived) lack of effectiveness of

risk reduction actions (17%), or HOA restrictions on cutting trees (14%). Although only 7% cited a lack of awareness of wildfire risk as a barrier keeping them from undertaking action, higher percentages of respondents reported that other types of information were barriers: 31% felt constrained by a “lack of information about, or options for, removal of slash or other materials from thinning trees and other vegetation”; and 22% felt constrained by a “lack of specific information on how to reduce wildfire risk on [their] property.”

Reflecting these perceived barriers to undertaking wildfire risk mitigation on their property, more than half of respondents reported that they would be encouraged to reduce the wildfire risk on their property by either financial assistance (56%) or help with thinning vegetation and/or removal of debris (61%). Most (82%) reported a willingness to participate in a cost-sharing grant program that would help cover the cost of removing vegetation to reduce their wildfire risk, with an average willingness to contribute around \$400 per acre for that work if the grant paid the remaining average of about \$600 per acre. Again reflecting the importance of information to respondents, 58% of respondents also reported that “specific information about what needs to be done” would encourage them to reduce the wildfire risk on their properties, and 38% reported that “a list of recommended contractors... to do the work” would encourage them.

Resident and Professional Wildfire Risk Ratings

Residents were asked their perception of the same set of ten wildfire risk factors in the survey as the wildfire specialist assessed. This section reports descriptive statistics for the two sets of measures (shown in Table 1), referring to these as resident (from the household surveys) and professional (from the wildfire specialist assessment) risk ratings. The “points” column of Table 1 depicts the relative weighting of each item in contributing to the property’s overall risk score; points reflect the relative importance of each factor in contributing to a property’s overall risk. A maximum relative risk rating for all 10 categories corresponds to a total of 595 points. The “resident survey” column presents the percentage of respondents selecting each response and the “professional assessment” column presents the percentage of parcels (for which a survey was returned) placed in each response category by the wildfire specialist. Comparison of the two sets of measures, and of the related overall risk assessment scores, offers insight into the possible risk perception gap discussed in the introduction.

Access Risk Factors

The first category of measures shown in Table 1, “Access Risk Factors,” assessed risk factors associated with property access. These factors reflect the importance of both the ability for residents to evacuate safely in the event of a wildfire and the ability for firefighters to adequately find a property and get their equipment onto its grounds in the event of a wildfire.

Table 1. Distribution of resident survey and professional assessment results for properties of survey respondents.

| Category | Criteria | Values | Points | Resident survey | Professional assessment |
|-------------------------------|---|--|--------|-----------------|-------------------------|
| | | | | Percent | |
| Access risk factors | Structure address posted at driveway entrance? | Posted and reflective | 0 | 29 | 5 |
| | | Posted, NOT reflective | 5 | 62 | 86 |
| | | Not visible from road | 15 | 9 | 10 |
| | How many roads could be used to get out of community? | Two or more roads in/out | 0 | 65 | 61 |
| | | One road in/out | 10 | 35 | 39 |
| Background risk factors | Width of driveway | Greater than 24 feet wide | 0 | 4 | 71 |
| | | Between 20-24 feet wide | 5 | 23 | 24 |
| | | Less than 20 feet wide | 10 | 72 | 5 |
| | | Distance to dangerous topography (ridge, steep drainage, or narrow canyon) | 0 | 81 | 83 |
| | Predominant background fuel type in neighborhood | More than 150 feet | 30 | 10 | 7 |
| | | 50-150 feet | 75 | 8 | 10 |
| | | Less than 50 feet | 25 | 2 | 15 |
| Structural risk factors | Roofing material | Moderate (light brush and/or isolated, small trees) | 50 | 47 | 56 |
| | | Heavy (dense brush or timber, down and dead fuel) | 75 | 51 | 29 |
| | | Tile, metal, asphalt | 0 | 98 | 98 |
| | Building exterior | Wood (shake shingle) | 200 | 2 | 2 |
| | | Non-combustible siding (e.g., stucco, cement, brick) | 0 | 49 | 35 |
| | | Log, heavy timbers | 20 | 9 | 9 |
| Defensible space risk factors | Balcony, deck, or porch | Wood, vinyl, or wood shake | 60 | 42 | 56 |
| | | None/non-combustible | 0 | 16 | 3 |
| | | Combustible material | 20 | 84 | 97 |
| | Defensible Space (CSFS 6.302 Standards; "closest distance from your house to overgrown, dense, or unmaintained vegetation") | More than 150 feet | 0 | 12 | 9 |
| | | 30-150 feet | 50 | 47 | 29 |
| | | 10-30 feet | 75 | 33 | 51 |
| | Location of woodpiles and combustibles (e.g., light flashy vegetation, propane tanks, trees, firewood, trash) | Less than 10 feet | 100 | 8 | 11 |
| | | None or > 30ft from structure | 0 | 59 | 7 |
| | | 10-30 feet from structure | 10 | 31 | 4 |
| | | < 10 feet from structure | 30 | 10 | 89 |

Respondents' understanding of the number of roads available for exiting the community do not differ from the wildfire specialist's findings (paired t-test, $p = 0.182$). This simple measure suggests good understanding of possible evacuation routes, although the 35 to 39% of residences with only one road face higher risk due to this factor. In contrast, resident and professional results differ regarding whether the property address is posted and reflective (paired t-test, $p < 0.001$) and for the width of the driveway (paired t-test, $p < 0.001$). Specifically, 23% of respondents reported a reflective address sign when the wildfire specialist recorded a posted, but non-reflective, sign. This suggests that nearly a quarter of surveyed properties have addressing that is less visible than the residents realize, particularly when considering the reduced visibility conditions of a wildfire event. Although reflectivity has a low risk weighting (5 points), this appears to be an opportunity for simple, low-cost education to reduce many properties' risks. Finally, although the comparative pattern of results for driveway suggests a possible data coding error, cross-tabulation (not shown) demonstrates a less systematic difference, yet one in which assessed widths in nearly all cases exceed survey-reported widths.

Background Risk Factors

The second category shown in Table 1, "Background Risk Factors," measured general features of the property and surrounding terrain that contribute to a property's wildfire risk due to typical fire behavior in those features. The first of these measures refers to the distance to topography (such as ridges, steep drainages, or narrow canyons) that contributes to wildfire risk through its impacts on fire behavior. Perhaps reflecting that these features tend to be prominent landscape features that stand out visually, the results of the two assessments do not differ (paired t-test, $p = 0.875$). In both the professional and resident assessments, approximately 1 out of 10 structures are within 50 feet of a dangerous feature, reflecting a significant source of risk for those properties.

In contrast, resident survey and professional assessment results for the types and density of background fuels in areas surrounding structures appear not to match (paired t-test, $p < 0.001$). For approximately 43% of properties, the wildfire specialist characterized the fuel type to be in a lower risk category than respondents did, whereas the wildfire specialist reported a more risky category than respondents for only about 10% of properties. Resident and professional ratings match for the remaining 47%. These results imply that respondents generally perceive a higher density of vegetation than the wildfire specialist. Though by no means definitive, this suggests that achieving lower-density vegetation for wildfire risk purposes (corresponding to the wildfire specialist's focus during the assessment) might not be perceived by residents as having a substantial visual impact on vegetation density. Such a result would imply that, for many properties, visual impacts might not be a significant barrier to risk mitigation through moderate vegetation density reductions.

Structural Risk Factors

The survivability of a structure during a wildfire event depends in large part on the combustibility of its materials; related factors are measured in the third category of Table 1, "Structural Risk Factors." More combustible materials include wood, vinyl,

and wood shake; less combustible materials include logs and heavy timbers; and materials such as stucco, cement, brick, and stone are considered non-combustible for relative risk assessment purposes. Predominant among these risk factors is whether the roof consists of wood shake shingle material or a Class A, non-combustible material such as tile, metal, or asphalt. Not surprisingly for such a straightforward measure, professional assessment and resident survey roof type results do not significantly differ (paired t-test, $p = 1.000$). Only 2% of structures were assigned the 200 risk points corresponding to the highly flammable wood shake shingles, despite the fact that roof type is not addressed by Ouray County wildfire mitigation regulations.

Reflecting that the other two structural risk factors considered are more complex, paired results demonstrate significant deviation between resident and professional ratings of these two factors (paired t-test, $p < 0.001$, in both cases). In measuring the building exterior risk factor, residents judged the type of material that covered the majority of the residence whereas the wildfire specialist focused on the extent to which the use of combustible materials in a structure's design contributes to that structure's vulnerability to wildfire. For example, a resident might judge a predominantly stucco house with an all wood upper section in the lowest risk category because most of the siding is stucco, but the professional would judge that same structure in a higher risk category because of the vulnerability of the wood section. Perhaps as a result, this category was rated as higher risk in the professional assessment than in the resident survey for 18% of properties, with only 4% of properties receiving a higher risk category in the survey than the assessment. The results for the remaining three-quarters of properties (77%) matched between the resident survey and the professional assessment. Similarly, the wildlife specialist considered nearly all properties as having a combustible deck, balcony, or porch (97%), whereas a smaller proportion of survey respondents (84%) rated their property as having a deck with combustible material, although this category is one for which the specialist had to assume the worst rating for many properties, due to a lack of observability. Overall, though, the physical materials used appear to contribute more to the wildfire risk of properties than residents of many properties acknowledged in the survey.

Defensible Space Risk Factors

According to the Colorado State Forest Service, "to protect a home from wildfire, the primary goal is to reduce or eliminate fuels and ignition sources within the [home ignition zone]" (CSFS 2012, p. 4). The final category of Table 1, "Defensible Space Risk Factors," reports the closest distance of two different fuel types to the structure. The first measure corresponds to relatively high point values and refers to the closest distance of "overgrown, dense, or unmaintained vegetation." The second measure corresponds to the closest distance of other combustibles, including woodpiles, propane tanks, trash, and light vegetation such as bushes or shrubs that could burn quickly and easily.

In both cases, many survey respondents overestimate the distance (and, equivalently, underestimate the risk) relative to the distances judged by the wildfire specialist, and responses statistically differ in both cases (paired t-tests, $p < 0.001$ for vegetation and $p < 0.001$ for other combustibles). Specifically, for vegetation, for which the relative risk (as reflected in the point values) is higher, 40% of resident survey results match

those of the professional assessment, but 39% of respondents overestimate the distance versus the wildfire specialist’s rating and 21% underestimate the distance. For other combustibles, a strong majority of respondents underestimate their risk (82%) whereas only 1% overestimate the risk relative to the specialist, although it is worth noting that the specialist had to assume this category for many of the 528 properties without permission to access. The wildfire specialist assessed that nearly 9 out of every 10 parcels had combustibles within 10 feet from the structure (89%). If the assumption of worst case risk for this category is accurate for most of these properties, this would imply that the movement of combustible objects further from primary structures may offer another opportunity for relatively low-cost reduction of the wildfire risk of many properties.

Overall Risk Assessment

Each property’s overall wildfire risk was assessed by adding the points for all ten evaluated risk factors. Adding the resident and professional results creates “sum of parts” resident and professional overall risk scores, respectively. These sums were then grouped into predetermined risk categories: Low (25-150 points), Moderate (151-175), High (176-270), Very High (271-330), and Extreme Risk (331-595). In addition, the household survey asked respondents to rate their property’s wildfire risk among the same five categories, based on the ten factors previously discussed, but without the respondent knowing the relative points assignments. This “direct question” offers a second measure of the resident’s perceived assessment of overall risk. Results of these three different overall risk measures are presented in Table 2.

Qualitatively, all three measures follow similar general distributions. In particular, the resident and professional sums of factors appear similar, with the majority of properties placed in the “High Risk” category. However, statistical tests that compare paired results across any two of the measures suggest, instead, that all three measures differ from each other (Monte Carlo simulation of Fisher’s exact test with 10^7 replications, $p < 0.001$, $p = 0.004$, and $p < 0.001$ for comparing survey sum with assessment sum, direct question with assessment sum, and survey sum with direct question, respectively⁵). In other words, close analysis demonstrates the presence of a risk perception gap between the resident and professional overall risk ratings, and this gap exists regardless of whether the resident rating is provided directly by the respondent or constructed from a composite of separate risk factors.

Table 2. Distribution of resident and professional overall risk ratings.

| | Points | Professional sum of factors | Resident sum of factors | Resident direct question |
|----------------|---------|-----------------------------|-------------------------|--------------------------|
| | | <i>Percent</i> | | |
| Low risk | 25-150 | 9 | 24 | 10 |
| Moderate risk | 151-175 | 11 | 13 | 49 |
| High risk | 176-270 | 66 | 54 | 30 |
| Very high risk | 271-330 | 10 | 7 | 8 |
| Extreme risk | 331-595 | 4 | 2 | 2 |

⁵ Collectively significant using the Holm-Bonferroni adjustment for the multiple pairwise comparisons.

For the resident sum of factors, nearly half of all responses match the corresponding assessment overall risk category (48%), with the remaining 36% and 15% responding with lower or higher risk categories than the wildfire specialist's assessment, respectively. In contrast, responses to the direct question only match the professional assessment for 29% of respondents, with 53% responding with a lower overall risk category than their corresponding professional assessment. Specifically, for one-third of all respondents (35%), their properties were assessed as "High Risk" but they choose the "Moderate Risk" category, suggesting that many survey respondents underestimate their overall risk despite being fairly accurate in their assessment of the individual risk factors. This implies that better understanding of the relative contribution of the different factors to overall wildfire risk would lead to improved understanding of overall wildfire risk itself. Overall, the statistically robust difference between resident and professional measures provides evidence of the hypothesized risk perception gap, meaning that residents do not understand the wildfire risk of their properties in the same way that a wildfire specialist does. As noted above, this risk perception gap persists despite the numerous opportunities for residents to learn about their property's specific wildfire risk factors and overall risk rating from the WRWC.

Observed Differences Between Survey Responders and Non-Responders

Finally, the paired datasets of the resident and professional measures allow unusually detailed consideration of possible differences between survey responders and non-responders through comparison of assessment results across three groups: responders, non-responders due to undeliverable surveys, and non-responders due to all other reasons. Statistical testing demonstrates that, for all but one of the risk factors, the means of the three different samples do not appear to differ (one-way anova F-test, p-values range from 0.258 to 0.566). That suggests that there are no differences between the three sample groups for most of the individual risk factors assessed. The only exception is the display of property's address (one-way anova F-test, $p = 0.004$), for which more properties without a matched survey were rated in the highest risk category. Most importantly, the means of the overall risk assessment scores, which are the sum of the individual risk factors weighted by the points assigned to each category shown in Table 1, do not statistically differ between the three samples (one-way anova F-test, $p = 0.484$). Similarly, the means of the risk assessments, once grouped into the five risk categories as shown in Figure 1, also do not statistically differ (one-way anova F-test, $p = 0.589$). Overall, the evidence suggests that the wildfire risk characteristics do not substantially differ between the properties of the respondents and the non-respondents to the household survey. This provides support for treating the returned surveys as representative of the population of properties in the Log Hill Mesa community.

Conclusions

Residents in the wildland urban interface can play an important role in mitigating the risk of wildfire on their properties. Understanding and encouraging this behavior

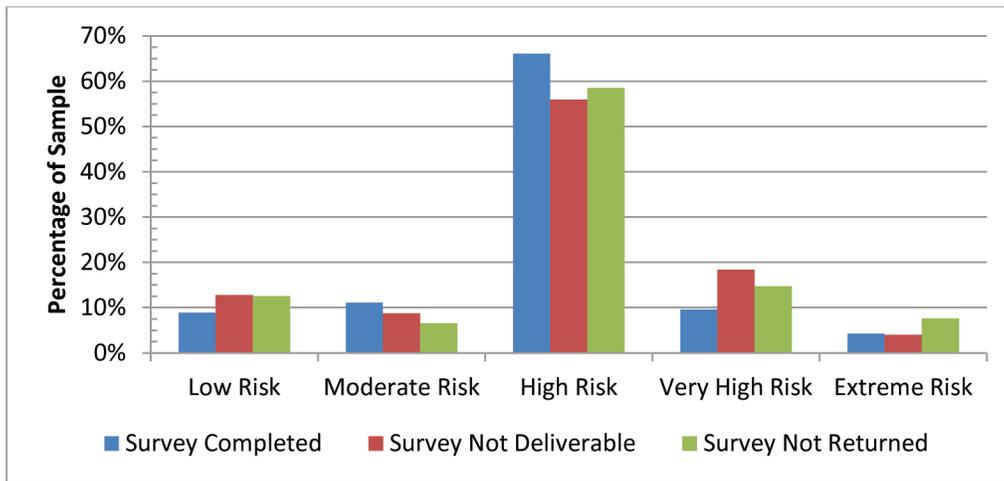


Figure 1. Distribution of overall risk assessment rating for properties with and without corresponding household surveys returned.

requires understanding residents’ knowledge, concern, and activities related to that risk, and recognizing that these factors might vary from one community to the next. This research note reports the results of a study aimed at improving that understanding.

Specifically, this report offers insight into the wildfire risk of the WUI community of Log Hill Mesa, in Ouray County, Colorado, and the relationship of the community with that risk. Based on survey responses, members of this community tend to be well educated, retired, and have higher annual incomes than residents of Ouray County overall. Typical residents live in the community year-round and have done so for about 10 years. Although respondents report limited personal experience with wildfire, they tend to have a high level of awareness and concern about the risk of wildfire to their properties. In general, they strongly support wildfire suppression efforts but also consider wildfire a natural part of a healthy forest.

Resident and professional assessments of the overall wildfire risk diverge for a large proportion of the properties in Log Hill Mesa, demonstrating the existence of a risk perception gap for this community that persists despite the efforts to educate residents on their wildfire risk. This risk perception gap exists both for a resident risk measure constructed from the weighted sum of ten separate property characteristics and for a direct question about the property’s overall level of wildfire risk. Resident and professional evaluation tends to differ for many of the individual risk factors, including address visibility, driveway width, background fuel density, structure external and deck materials, and the distance to dangerous vegetation and to other combustibles. In contrast, resident and professional evaluations do not differ for the number of roads available for evacuation, the distance to topography dangerous for wildfires, or the type of roof installed.

The details of the report provide information that may be useful to practitioners tasked with understanding and influencing the relationship of WUI residents with wildfire risk and to policymakers who must make decisions about wildfire suppression and risk mitigation. In addition, this report provides a baseline for further analysis of the perspectives of this community and the nature of the observed gap between resident and professional wildfire risk assessment.

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Appendix A: Copy of Household Survey with Descriptive Results

Living with Wildfire on Log Hill Mesa



www.COwildfire.org www.loghillfire.org

(n=291)

Key: **Red ALL CAPS** are variable names
n=number of observations
Blue numbers are percent responses

What is the West Region Wildfire Council?

The West Region Wildfire Council (WRWC) was established in 2007 as a collaborative effort to support interagency efforts to develop and implement plans to better mitigate the threat of catastrophic wildland fire to the communities and natural resources in the Colorado counties of Delta, Gunnison, Hinsdale, Montrose, Ouray, and San Miguel. WRWC members represent private citizens, local, county, state, and federal agencies with an interest in, and a commitment to addressing wildfire risk across the region. Members have worked with homeowners, fire districts, and counties to develop Community Wildfire Protection Plans in the region. The WRWC provides communities with education about wildfire risk and assistance with implementing steps to reduce wildfire risk through fuels reduction projects and the creation of defensible space.

Section 1: In this first section of the survey, we ask about your residence on Log Hill Mesa. If you own multiple homes, please answer the following questions with respect to your Log Hill Mesa residence. We refer to this home as your *current residence*.

OWNRENT (n=289)

1.1 Do you own or rent your current residence? (*Circle one number*)

93% 0 Own

7% 1 Rent

MONTHS (n=287)

1.2 How many months per year do you live at your current residence? (*Fill in the blank*)

MEAN = 11 months; 82% = 12 months

FULLTIME (n=285)

1.3 In what year did you move to your current residence? (*Fill in the blank*)

MEAN = 2002

YRBUILD (n=281)

1.4 In what year was your current residence originally built? (*Fill in the blank*)

MEAN = 1996

MOVE1 (n=283)

1.5 Do you expect to move away and/or sell your current residence in the next five years?
(*Circle one number*)

80% 0 No

20% 1 Yes

RISKAWAR (n=290)

1.6 How aware of wildfire risk were you when you bought or decided to rent your current residence? (*Circle one number*)

| | | |
|------|---|----------------|
| 9% | 0 | Not aware |
| 45% | 1 | Somewhat aware |
| 46% | 2 | Very aware |
| 0.3% | 3 | Don't remember |

CONCERNED (n=289)

1.7 Are you concerned about wildfire risk affecting your current residence? (*Circle one number*)

| | | |
|-----|---|-----|
| 7% | 0 | No |
| 93% | 1 | Yes |

Section 2: In this section, we ask about your experience, if any, with wildfire.

FIRE (n=289)

2.1 What is the closest distance (as a crow flies) a wildfire has come your current residence?
(Circle one number)

- | | | |
|-----|---|---|
| 2% | 0 | There has been a wildfire on your property |
| 27% | 1 | Less than 2 miles away but not on your property |
| 18% | 2 | 2 to 10 miles away |
| 24% | 3 | More than 10 miles away |
| 28% | 4 | Not sure |

DAMAGE (n=289)

2.2 Has your current residence ever been damaged by a wildfire or smoke from a wildfire?
(Circle one number)

- | | | |
|------|---|--|
| 100% | 0 | No |
| 0% | 1 | Yes, your current residence suffered only smoke damage |
| 0% | 2 | Yes, your current residence suffered fire and smoke damage |

EVACPLAN (n=287)

2.3 Do you currently have an evacuation plan for your household in the event a wildfire threatens your current residence? (Circle one number)

- | | | |
|-----|---|-----|
| 24% | 0 | No |
| 76% | 1 | Yes |

REVERSECALL (n=290)

2.4 Have you ever received a reverse 911 call to evacuate or prepare to evacuate your current residence due to wildfire? (Circle one number)

- | | | |
|------|---|-----|
| 100% | 0 | No |
| 0% | 1 | Yes |

EVACUATED (n=290)

2.5 Have you ever evacuated from your current residence due to a wildfire or threat of a wildfire? (*Circle one number*)

99.7% 0 No

0.3% 1 Yes

PREVRISK (n=289)

2.6 Have you ever owned a home (in Colorado or elsewhere), other than your current residence, that was located in an area at risk of wildfire? (*Circle one number*)

66% 0 No

34% 1 Yes

KNOWEVAC (n=288)

2.7 Do you know anyone (in Colorado or elsewhere) who has been evacuated from his or her home due to a wildfire? (*Circle one number*)

70% 0 No

30% 1 Yes

KNOWDAM (n=287)

2.8 Do you know anyone whose home has been damaged or lost due to a wildfire? (*Circle one number*)

84% 0 No

16% 1 Yes

INSURE1 (n=287)

2.9 Have you been contacted by your current or a previous homeowners insurance company about your current residence being in an area at risk of wildfire? (*Circle one number*)

91% 0 No → Skip to Section 3, Question 3.1

9% 1 Yes

INSURE2 (n=29)

2.10 Has your current or a previous homeowners insurance company ever provided information on reducing the risk of wildfire on your property? *(Circle one number)*

41% 0 No

59% 1 Yes

INSURE3 (n=29)

2.11 Did an insurance company ever cancel or refuse to renew your homeowners insurance because of the risk of wildfire on your property? *(Circle one number)*

86% 0 No

14% 1 Yes

INSURE4 (n=24)

2.12 Do you pay a higher premium for your homeowners insurance due to wildfire risk? *(Circle one number)*

46% 0 No

54% 1 Yes

Section 3: In this section, we ask about the characteristics of your *current residence* and the area near your *current residence*.

ROOFTYPE (n=289)

3.1 What type of roof does your current residence have? (*Circle one number*)

- 2% 0 Wood (shake shingles)
 98% 1 Tile, metal, or asphalt shingles

SIDETYPE (n=286)

3.2 What type of exterior siding covers the **majority** of your current residence? (*Circle one number*)

- 49% 0 Stucco, cement, brick, stone, or other noncombustible siding
 9% 1 Log or heavy timbers
 42% 2 Wood or vinyl siding

BALCONY (n=291)

3.3 Does your current residence have a balcony, deck, or porch? (*Circle one number*)

- 5% 0 No
 95% 1 Yes → Is **any** part of the balcony, deck, or porch made of wood? (*Circle one number*) BALCONY2 (n=272)
 12% 0 No
 88% 1 Yes

DRIVEWAY (n=287)

3.4 How wide is your driveway at the **narrowest** point? (*Circle one number*)

- 72% 0 Less than 20 feet (one car wide)
 23% 1 20 – 24 feet (two cars wide)
 4% 2 More than 24 feet (more than two cars wide)

HOMENUM (n=290)

3.5 Is your house number posted at the end of your driveway? (*Circle one number*)

9% 0 No
 91% 1 Yes → Is the posted number reflective? (*Circle one number*) REFLECT (n=255)
 68% 0 No
 32% 1 Yes

CLOSEVEG (n=287)

3.6 What is the **closest** distance from your house to overgrown, dense, or unmaintained vegetation? (*Circle one number*)

8% 0 Less than 10 feet
 33% 1 10 – 30 feet
 47% 2 31 – 150 feet
 12% 3 More than 150 feet

COMBUST (n=285)

3.7 What is the **closest** distance from your house to combustible items other than vegetation such as lumber, firewood, a propane tank, hay bales, or other materials that could easily ignite? (*Circle one number*)

10% 0 Less than 10 feet
 31% 1 10 – 30 feet
 59% 2 More than 30 feet

RIDGE (n=289)

3.8 What is the **closest** distance from your house to a ridge, steep drainage, or narrow canyon? (*Circle one number*)

8% 0 Less than 50 feet
 10% 1 50 – 150 feet
 81% 2 More than 150 feet

ROADS (n=288)

3.9 If the road you use to access your current residence was blocked due to a wildfire, is there another road you could use to get out of your community? (*Circle one number*)

35% 0 No
 65% 1 Yes

DOMVEG (n=288)

3.10 Which of the following best describes the **dominant** vegetation on your property and those properties immediately surrounding you? (*Circle one number*)

- 2% 0 Grasses
- 47% 1 Light brush and/or isolated trees (e.g., grass/sage mix with some pinion-juniper and/or ponderosa pine)
- 51% 2 Dense brush and/or dense trees (e.g., clusters of pinion-juniper and/or ponderosa pine)

RISKRATE (n=289)

3.11 Homes are assessed for overall wildfire risk based on the items asked about in questions 3.1 – 3.10 above. What do you think is your home’s **current** overall wildfire risk rating? (*Circle one number*)

- 10% 0 Low Risk
- 49% 1 Moderate Risk
- 30% 2 High Risk
- 8% 3 Very High Risk
- 2% 4 Extreme Risk

CHANCES 1 (n=285)

3.12 What do you think is the chance that a wildfire will start on or spread to your property this year? (*Circle one number*)

| 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | 0 |
|-------------|------|----|----|----|-----|----|-----|-----|-----|---------------|
| For | | | | | | | | | | No |
| Sure | | | | | | | | | | Chance |
| 0.3% | 0.3% | 1% | 2% | 6% | 29% | 8% | 12% | 15% | 22% | 4% |

CHANCES2 (n=286)

3.13 If a wildfire starts on or spreads to your property this year, what do you think is the chance that your home will be destroyed or severely damaged? (*Circle one number*)

| 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | 0 |
|-------------|----|-----|----|----|-----|----|-----|-----|-----|---------------|
| For | | | | | | | | | | No |
| Sure | | | | | | | | | | Chance |
| 5% | 7% | 10% | 7% | 5% | 25% | 7% | 11% | 10% | 13% | 2% |

Section 4: Please think about the properties across the street, next to, or bordering your property (may include vacant lots or publicly owned land). Even if you live on a large property and your neighbors are far away, the following questions refer to the owners/managers of these adjacent properties as your *neighbors*. The properties themselves are referred to as *neighboring properties*.

TALKFIRE (n=290)

4.1 Have you ever talked about wildfire issues with a neighbor? (*Circle one number*)

44% 0 No

56% 1 Yes

NACTION (n=289)

4.2 Have any of your neighbors done anything to reduce the risk of wildfire on their property? (*Circle one number*)

23% 0 No → Skip to Question 4.5

58% 1 Yes

19% 2 Don't know → Skip to Question 4.5

WHENACT (n=167)

4.3 When did your neighbors undertake action(s) to reduce risk of wildfire on their property in relation to any actions you have undertaken? (*Circle one number*)

6% 0 You have not taken any action

19% 1 They took action before you did

25% 2 They took action after you did

1% 3 They plan to take action

31% 4 You took action around the same time

19% 5 Don't know

WORKN (n=170)

4.4 Have you ever worked with any of your neighbors to reduce the risk of wildfire on your property or that of your neighbors? (*Circle one number*)

64% 0 No

12% 1 Yes, on your property

1% 2 Yes, on your neighbors' properties

24% 3 Yes, on both your property and your neighbors' properties

SLACKER (n=286)

4.5 Do you have any neighbors who are not taking action to address what you would consider sources of wildfire risk in the event of a wildfire (e.g., dense vegetation) on their property?

(Circle one number)

- 21% 0 No
- 53% 1 Yes
- 26% 2 Don't know

4.6 How would you describe the vegetation on your property and the neighboring properties?

(Circle one number for each)

| | Very Sparse | | | | Very Dense |
|---|------------------------|-----|-----|-----|-----------------------|
| When you first moved in, the vegetation on your property was... VEG1 (n=286) | 2% | 10% | 33% | 26% | 29% |
| Currently, the vegetation on your property is... VEG2 (n=286) | 3% | 29% | 47% | 15% | 6% |
| When you first moved in, the vegetation on most of the neighboring properties was... VEG3 (n=284) | 1% | 8% | 29% | 31% | 31% |
| Currently, the vegetation on most of the neighboring properties is... VEG4 (n=284) | 1% | 11% | 34% | 37% | 17% |

Section 5: In this section, we ask about sources of wildfire information and wildfire beliefs.

5.1 From which of the following sources have you received information about reducing the risk of wildfire? (Circle all that apply)

(n=291) 1 = circled; 0 = not circled; % reported is % circled

- 68% 1 Local fire department SOURCE1
- 40% 2 West Region Wildfire Council SOURCEw
- 44% 3 Neighborhood group (homeowners group, neighborhood watch, etc.) SOURCE2
- 32% 4 Neighbors, friends, or family members SOURCE3
- 35% 5 Media (newspaper, TV, radio, internet) SOURCE4
- 27% 6 Colorado State Forest Service SOURCE6
- 20% 7 US Forest Service or US Bureau of Land Management SOURCE7
- 11% 8 A wildfire related website SOURCEWEB
- 9% 9 Other→Please describe: SOURCE9
- 9% 10 None of the above. You have not received any information about wildfire SOURCE10

5.2 If there is a wildfire on your property, how likely do you think it is that the following would occur? (Circle one number for each item)

| | Not Likely | 1 | 2 | 3 | 4 | 5 | Very Likely | Not Applicable |
|--|------------|-----|-----|-----|-----|-----|-------------|----------------|
| You would put the fire out. LACT1 (n=281) | 32% | 30% | 17% | 9% | 11% | 1% | | |
| The fire department would save your home. LACT2 (n=279) | 8% | 14% | 29% | 27% | 22% | 0% | | |
| There would be some smoke damage to your home. LACT3 (n=280) | 2% | 8% | 23% | 25% | 41% | 2% | | |
| There would be some physical damage to your home. LACT4 (n=281) | 4% | 10% | 24% | 27% | 33% | 1% | | |
| Your home would be destroyed. LACT5 (n=282) | 18% | 19% | 24% | 21% | 16% | 1% | | |
| You would suffer financial losses due to the loss of business/income on your property. LACT6 (n=281) | 31% | 8% | 7% | 12% | 21% | 21% | | |
| Your trees and landscape would burn. LACT7 (n=281) | 1% | 6% | 15% | 21% | 56% | 1% | | |

| | | | | | | |
|--|-----|-----|-----|-----|-----|-----|
| Your pets would be harmed (include non-income generating livestock) LACT8 (n=274) | 32% | 19% | 14% | 10% | 5% | 20% |
| Your neighbors' homes would be damaged or destroyed. LACT9 (n=281) | 5% | 10% | 28% | 27% | 28% | 2% |
| Your community water supply would be threatened. LACT10 (n=275) | 23% | 16% | 18% | 16% | 20% | 6% |
| The fire would spread to nearby public lands. LACT11 (n=279) | 11% | 10% | 17% | 20% | 34% | 8% |

5.3 How much do you agree or disagree with the following statements about wildfire? (Circle one number for each statement)

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|----------------|-------|---------|----------|-------------------|
| Naturally occurring wildfire is not the problem; people who choose to live in fire prone areas are the problem. STATE1 (n=282) | 8% | 27% | 35% | 22% | 9% |
| With proper technology, we can control most wildfires after they have started. STATE2 (n=283) | 4% | 20% | 31% | 37% | 8% |
| Wildfires that threaten human life should be put out. STATE3 (n=284) | 55% | 38% | 4% | 1% | 1% |
| Wildfires that threaten property should be put out. STATE4 (n=282) | 38% | 48% | 12% | 1% | 1% |
| During a wildfire, saving homes should be a priority over saving forests. STATE5 (n=285) | 36% | 40% | 16% | 6% | 1% |
| Wildfires are a natural part of the balance of a healthy forest/ecosystem. STATE6 (n=281) | 42% | 40% | 13% | 4% | 1% |
| You live here for the trees and will not remove any of them to reduce wildfire risk. STATE11 (n=285) | 1% | 5% | 16% | 45% | 33% |
| Managing the wildfire danger is a government responsibility, not yours. STATE13 (n=285) | 0.3% | 2% | 15% | 45% | 38% |
| Actions taken by homeowners to reduce the risk of loss due to wildfire are not effective. STATE14 (n=284) | 1% | 3% | 13% | 49% | 34% |

| | | | | | |
|---|-----|-----|-----|-----|-----|
| Your property is at risk of wildfire. STATE15 (n=285) | 22% | 54% | 18% | 5% | 1% |
| You don't take action because adjacent properties are not treated leaving your actions ineffective. STATE17 (n=283) | 1% | 6% | 17% | 44% | 33% |

Section 6: In this section, we would like to know about your willingness to reduce the risk of wildfire on your property.

6.1 Please tell us if each item listed below is a factor that keeps you from undertaking actions to reduce the wildfire risk on your property. *(Circle one number for each item)*

| | Keeps you from taking action? | |
|---|-------------------------------|-----|
| | No | Yes |
| Financial expense/ cost FACTOR1 (n=276) | 61% | 39% |
| Time it takes to do the work FACTOR2 (n=276) | 70% | 30% |
| Physical difficulty of doing the work FACTOR3 (n=273) | 62% | 38% |
| Lack of specific information on how to reduce wildfire risk on your property FACTOR4 (n=275) | 78% | 22% |
| Lack of effectiveness of risk reduction actions FACTOR5 (n=272) | 83% | 17% |
| Do not want to change the way your property looks FACTOR6 (n=271) | 72% | 28% |
| Lack of information about or options for removal of slash or other materials from thinning trees and other vegetation. FACTOR7 (n=274) | 69% | 31% |
| Lack of awareness of wildfire risk FACTOR8 (n=276) | 93% | 7% |
| Restrictions by homeowners' association on cutting trees FACTOR9 (n=270) | 86% | 14% |

6.2 Would any of the following items encourage you to reduce the wildfire risk on your property? *(Circle all that apply)*

(n=288) 1 = circled; 0 = not circled; % reported is % circled

| | | |
|-----|---|--|
| 56% | 1 | Financial assistance INCENTV1 |
| 58% | 2 | Specific information about what needs to be done INCENTV2 |
| 61% | 3 | Help doing the work (thinning trees and vegetation and/or removal of debris) INCENTV3 |
| 38% | 4 | A list of recommended contractors that could be hired to do the work INCENTV4 |
| 19% | 5 | Other (what? INCENTV5) |

PARTICIPATE (n=262)

6.3 While costs vary, the average cost to a homeowner of having a contractor remove vegetation to reduce wildfire risk is approximately \$1000 per acre. If your property is less than one acre, the average cost to reduce risk on the entire property is approximately \$1000. If a grant program paid for a share of the cost of this work on your property, would you participate in the program? *(Circle one number)*

18% 0 No

82% 1 Yes → Please circle the highest amount that you would be willing to pay per acre to have a contractor remove vegetation. **AMTUPAY (n=204)**

Amount you pay /Amount grant pays per acre

| | | | |
|-----|--------|---|--------|
| 9% | \$1000 | / | \$0 |
| 6% | \$800 | / | \$200 |
| 19% | \$600 | / | \$400 |
| 26% | \$400 | / | \$600 |
| 27% | \$200 | / | \$800 |
| 13% | \$0 | / | \$1000 |

Section 7: In this section, we ask about personal and household characteristics. As with all questions in this survey, your responses are completely confidential.

AGE (n=269)

7.1 What is your age? (*Fill in the blank*)

MEAN = 62

GENDER (n=267)

7.2 Are you? (*Circle one number*)

63% 0 Male

37% 1 Female

EDUC (n=263)

7.3 What is the highest grade or year of school you completed? (*Circle one number*)

1% 0 Less than high school

6% 1 High school graduate

19% 2 Some college or technical school

4% 3 Technical or trade school

33% 4 College graduate

13% 5 Some graduate work

24% 6 Advanced Degree (M.D., M.A., M.S., Ph.D., etc.)

EMPLOY (n=266)

7.4 Which of the following best describes your current employment situation? (*Circle one number*)

29% 0 Employed full time (including self-employed)

15% 1 Employed part time (including self-employed)

7% 2 Unemployed or do not work outside of the home

49% 3 Retired

INCOME1 (n=222)

7.5 Which of the following categories describes your annual household income? (*Circle one number*)

| | | |
|-----|---|-----------------------|
| 3% | 0 | Less than \$15,000 |
| 5% | 1 | \$15,000 - \$24,999 |
| 6% | 2 | \$25,000 – \$34,999 |
| 11% | 3 | \$35,000 - \$49,999 |
| 23% | 4 | \$50,000 - \$74,999 |
| 23% | 5 | \$75,000 - \$99,999 |
| 14% | 6 | \$100,000 - \$149,999 |
| 9% | 7 | \$150,000 - \$199,999 |
| 6% | 8 | More than \$200,000 |

Thank you for your help. Please use the space below to write any additional comments.



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